REMARKS

Claims 1-11 and 22-25 have been cancelled. Claims 12 and 18 have been amended. New claims 26-39 have been added. Support for the amendments can be found throughout the specification, for example, at page 1, line 22 to page 2, line 3 of the specification. No new matter has been added.

Restriction/Election

The Examiner has required restriction to Group I, claims 1-11 and 23-25, drawn to a composition; to Group II, claims 12-21, drawn to an imaging method; or Group III, claim 22, drawn an imaging system. Applicants confirm the election of Group II, claims 12-21. Accordingly, claims 1-11 and 22-25 have been cancelled without prejudice.

Rejection under 35 U.S.C. § 112, second paragraph

Claims 12-21 have been rejected under 35 U.S.C. § 112, second paragraph, for being indefinite. Specifically, the Examiner argues that independent claim 12 is incomplete and thus indefinite because "[i]t's unclear how the emission of the particle can be generated." See the Office Action at page 4. Claims 13-21 depend from claim 12. Applicants respectfully disagree.

In order to advance prosecution, claim 12 has been amended. Applicants have discovered a method of imaging a lymphatic system of an animal that includes introducing a composition subcutaneously in the animal, the composition including a particle including a semiconductor nanocrystal; **exciting the particle with an excitation light source**; and detecting emission from the particle. See Claim 12 as amended. The claim particularly points out and distinctly claims the method. Accordingly, Applicants respectfully ask that the Examiner reconsider and withdraw the rejection under 35 U.S.C. § 112, second paragraph.

Rejection under 35 U.S.C. § 103(a)

Claims 12-21 have been rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,496,536 to Wolf ("Wolf") in view of U.S. Patent No. 6,207,229 to Bawendi et al. ("Bawendi"), U.S. Patent No. 6,207,392 to Weiss et al. ("Weiss") or U.S. Patent No. 6,530,944 to

West et al. ("West"). See the Office Action at pages 5-6. Claim 12 is independent, and claims 13-21 depend from it.

Specifically, the Examiner argues that Wolf teaches "a method of imaging a lymphatic structure comprising applying a particulate contrast agent subcutaneously wherein the agent is a nanoparticle. . . . The Bawendi, Weiss, and West patents each teach a semiconductor nanocrystal that exhibit superior emission which makes them useful in biomedical imaging." See the Office Action at page 6.

Applicants respectfully disagree. Applicants have discovered a method of imaging a lymphatic system of an animal that includes introducing a composition subcutaneously in the animal, the composition including a particle including a semiconductor nanocrystal; exciting the particle with an excitation light source; and **detecting emission from the particle**. See Claim 12. Wolf does not teach a method of imaging a lymphatic system of an animal that includes exciting a particle and **detecting emission from the particle**.

Wolf describes the importance of appropriate particle size in selecting an contrast agent for use in imaging the lymphatic system. See Wolf at, e.g., column 5, lines 20-25. Wolf contemplates imaging methods such as X-ray and computed tomography; MRI; and ultrasound. See Wolf at, e.g., column 6, lines 26-43. For X-ray and computed tomography imaging, the contrast agent is imaged by virtue of its higher absorption of X-rays than other materials (i.e., animal tissue). In MRI imaging, the contrast agent is imaged by virtue of its nuclear magnetic resonance with an applied radio frequency in the presence of a strong magnetic field. In ultrasound imaging, the contrast agent is chosen for its different density or acoustical properties than surrounding material. None of the imaging methods contemplated by Wolf includes **exciting the particle with an excitation light source and detecting emission from the particle**. Indeed, Wolf does not teach, suggest, or motivate a person skilled in the art to image a lymphatic system of an animal by introducing a composition including a particle including a semiconductor nanocrystal subcutaneously in the animal, exciting the particle with an excitation light source, and detecting emission from the particle.

None of Bawendi, Weiss or West remedies this defect. Bawendi describes luminescent semiconductor nanocrystals having a core and an overcoating. See Bawendi at Abstract. Weiss

teaches semiconductor nanocrystals capable of linking to affinity molecules. See Weiss at Abstract. Neither Bawendi nor Weiss teaches introducing a composition subcutaneously in an animal. West does not teach a particle including a semiconductor nanocrystal. West describes particles doped with luminescent rare-earth ions. See West at column 5 lines 15-23, and at column 24, line 51 – column 25, line 8. Thus, the combination of Wolf with Bawendi, Weiss, or Wolf, fails to teach, suggest or motivate a person skilled in the art to carry out the claimed method.

Furthermore, because Wolf does not teach an imaging method that relies on exciting a particle with an excitation light source and detecting emission from the particle, there is no motivation to combine Wolf with any of Bawendi, Weiss, or West. Because Wolf does not teach that a particle capable of excitation and emission is desirable, a person skilled in the art would not look to Bawendi, Weiss, or West to modify the teachings of Wolf.

With further regard to claim 14 (and claims 15-16 which depend from claim 14), the cited portions of Wolf (col. 5, lines 49-56 and col. 6, lines 26-43) and Weiss (col. 2, lines 47-63) do not teach that detecting emission includes generating an image in the near-infrared or infrared wavelength region. While Wolf does refer to imaging methods such as x-ray, MRI and ultrasound, none of these methods involve generating an image in the near-infrared or infrared wavelength region. Weiss does describe generating an image of any kind. Neither do Bawendi nor West.

With further regard to claim 20, none of the cited references teaches a nanocrystal that includes a core of a first semiconductor material and an overcoating of a second semiconductor material on the core, wherein the first semiconductor material and the second semiconductor material are selected so that, upon excitation, **one carrier is substantially confined to the core and the other carrier is substantially confined to the overcoating**. Bawendi and Weiss teach overcoated nanocrystals in which the semiconductor materials are selected so that overcoating material has a larger band gap than core material, and therefore both carriers are confined to the core. West does not teach a nanocrystal that includes a core of a first semiconductor material and an overcoating of a second semiconductor material. See West at, for example, column 4,

lines 59-63, describing particles having a dielectric or semiconducting core and a conducting shell. Nor does Wolf remedy this defect.

For at least these reasons, claim 12 and the claims that depend from it are patentable over Wolf in view of Bawendi, Weiss, and West. Applicants therefore respectfully ask that the Examiner reconsider and withdraw the rejection under 35 U.S.C. § 103(a).

Rejection under obviousness-type double patenting

The Examiner has provisionally rejected claims 12-21 under the doctrine of obviousness-type double patenting over claims 13-23 of Application No. 10/772,424. The Examiner contends that the claims are not patentably distinct because both are directed to "method of using semiconductor nanocrystals in imaging. The only difference is that the claims of the conflicting application are to use imaging tissue as opposed to imaging lymphatic system of the instant claims." See the Office Action at pages 4-5.

Applicants believe that the amendments and arguments above have overcome all other grounds of rejection . If the provisional obviousness type double patenting rejection is the only remaining rejection, Applicants respectfully ask that the Examiner withdraw the rejection and allow the pending claims, in accord with MPEP 804 section I, subsection B.

New Claims

New claims 26-39 have been added. Claims 26-34 depend from claim 12. Independent claim 35 and the claims that depend from it are drawn to an imaging method. Applicants believe the new claims are patentable, and ask that the Examiner allow them. None of the cited references teach or suggest a method of imaging a lymphatic system of an animal that includes introducing at an injection site a composition subcutaneously in the animal, the composition including a particle including a semiconductor nanocrystal, exciting the particle with an excitation light source, and detecting emission from the particle.

CONCLUSION

Applicants ask that all claims be allowed. If it would be helpful, the Examiner is invited to contact the undersigned representative at 202-429-3000. Please apply any charges or credits to deposit account 19-4293.

Respectfully submitted,

Date: 1-12-06

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